

Flight Testing of Resource allocation for Multi-Agent Planning (ReMAP) System for Unmanned Vehicles, Phase II

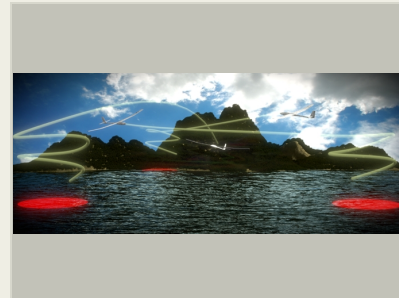
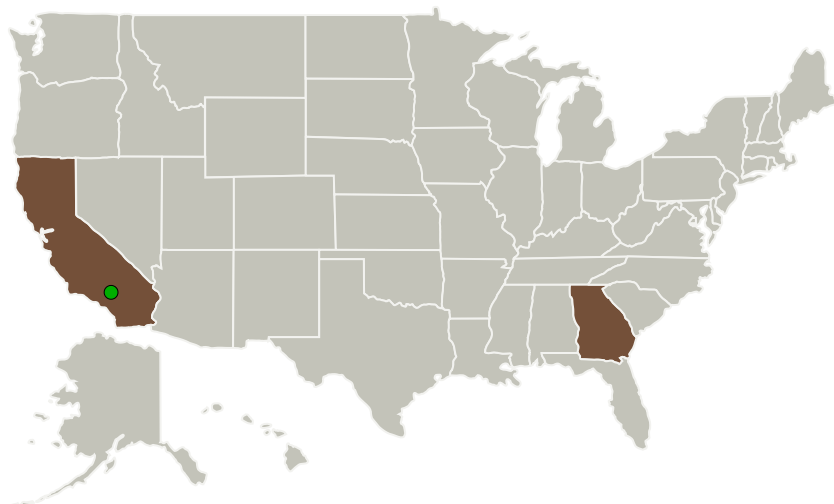
Completed Technology Project (2016 - 2018)



Project Introduction

Area-I, Incorporated personnel have led the design, fabrication, and flight testing of fourteen unmanned aircraft, one manned aircraft, and numerous advanced guidance, control, and avionics packages. Area-I has continued this tradition in its development of the Resource allocation for Multi-Agent Planning, or ReMAP, guidance and navigation system for unmanned aircraft. The ReMAP system, whose core function is to significantly reduce operator workload by providing mission-driven autonomy to unmanned aircraft in single- and multi-agent scenarios, was proven through flight testing during the Phase I program. The work proposed will further mature the ReMAP technology and core capabilities, resulting in continued flight-based evaluations on Area-I aircraft. Core capabilities provided by the ReMAP system include: 1) A small, lightweight, inexpensive avionics package that provides real-time mission-driven guidance capabilities to unmanned air vehicles 2) A system architecture that is platform and autopilot agnostic and can therefore be utilized by a wide array of aircraft with varying performance levels 3) A multi-agent planning and control algorithm to allow multiple aircraft to coordinate and thereby maximize mission capabilities and results 4) Aircraft and obstacle avoidance capabilities, including ADS-B In integration, providing autonomous avoidance maneuvers or operator warnings 5) A mission planning interface to provide situational awareness and mission management to operators, usable as a stand-alone system or integrated with existing mission planning tools such as NASA's Airborne Science Mission Tools Suite

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Area-I, Inc.	Lead Organization	Industry	Kennesaw, Georgia
● Armstrong Flight Research Center(AFRC)	Supporting Organization	NASA Center	Edwards, California

Primary U.S. Work Locations	
California	Georgia

Images



Briefing Chart Image

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(<https://techport.nasa.gov/image/131481>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Area-I, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

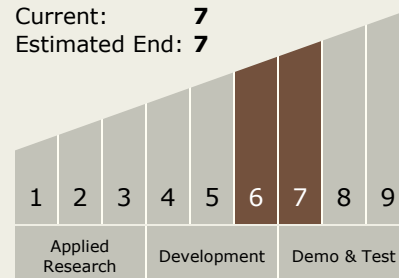
Carlos Torrez

Principal Investigator:

Daniel Kuehme

Technology Maturity (TRL)

Start: 6
Current: 7
Estimated End: 7



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Technology Areas

Primary:

- TX02 Flight Computing and Avionics
 - └ TX02.2 Avionics Systems and Subsystems
 - └ TX02.2.2 Aircraft Avionics Systems

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System